

What is claimed:

1 1. A method for detecting a communication transfer rate over a network, the
2 method comprising:
3 requesting a first communication link connection on the network using a default
4 transfer rate;
5 requesting a second communication link connection on the network using a
6 secondary transfer rate, if the requested first communication link connection at the
7 default transfer rate is unsuccessful;
8 monitoring a number of successful communication link connections established
9 using the secondary transfer rate; and
10 changing a value of the default transfer rate to a value of the secondary transfer
11 rate if the number of successful communication link connections at the secondary
12 transfer rate exceeds a predetermined threshold value.

1 2. The method according to claim 1, wherein the network comprises an integrated
2 services digital network (ISDN) for communicating digital information.

1 3. The method according to claim 1, wherein the default transfer rate is
2 approximately 64 Kbps.

1 4. The method according to claim 1, further comprising receiving a failed
2 connection signal in response to the request for the first communication link connection
3 indicating that the first communication link connection at the default transfer rate is
4 unsuccessful.

1 5. The method according to claim 1, wherein the secondary transfer rate is
2 approximately 56 Kbps.

6. A method of operating communication equipment coupled to a data communication network, the method comprising:

- establishing a plurality of communication links on the data communication network, each one of the communication links comprises:
 - requesting a first data communication link using a default communication transfer rate of 64 Kbps,
 - receiving an indication from the data communication network that the first data communication link was unsuccessful, and
 - requesting a second data communication link using a secondary communication transfer rate of 56 Kbps;
- monitoring a number of successful second data communication link requests using the secondary communication transfer rate;
- changing the default communication transfer rate to 56 Kbps if the number of successful second data communication link requests exceeds a predetermined threshold value; and
- establishing a plurality of subsequent communication links on the data communication network comprising requesting a first data communication link using a default communication transfer rate of 56 Kbps.

1 A method of operating communication equipment coupled to a data
2 communication network, the method comprising:
3 establishing a plurality of communication links on the data communication
4 network, each one of the communication links comprises:
5 requesting a first data communication link using a default
6 communication transfer rate of 64 Kbps,
7 receiving an indication from the data communication network that the
8 first data communication link was unsuccessful, and
9 requesting a second data communication link using a secondary
10 communication transfer rate of 56 Kbps;

11 monitoring a number of unsuccessful first data communication link requests
12 using the default communication transfer rate;
13 changing the default communication transfer rate to 56 Kbps if the number of
14 unsuccessful first data communication link requests exceeds a predetermined threshold
15 value; and
16 establishing a plurality of subsequent communication links on the data
17 communication network comprising requesting a first data communication link using a
18 default communication transfer rate of 56 Kbps.

1 8. A communication router comprising:
2 a communication interface which can be coupled to a communication
3 network to establish a data communication link;
4 a register circuit coupled to a processor to monitor the number of
5 successful and/or unsuccessful data communication links; and
6 the processor initiates data communication links at either a default
7 communication rate, or a secondary communication rate, and the processor
8 adjusts a value of the default communication rate in response to the register
9 circuit.

1 9. The communication router of claim 8 wherein the default communication rate
2 and the secondary communication rate are selected from the group comprising 64 Kbps
3 and 56 Kbps.

1 10. The communication router of claim 8 wherein the communication network is an
2 integrated services digital network (ISDN).

1 11. The communication router of claim 8 wherein the processor adjusts the value of
2 the default communication rate when a value of the register circuit exceeds a
3 predetermined threshold value.

1 12. The communication router of claim 8 wherein the register circuit monitors a
2 number of unsuccessful data communication links attempted using the default
3 communication rate.

1 13. The communication router of claim 8 wherein the register circuit monitors a
2 number of successful data communication links attempted using the secondary
3 communication rate.

1 14. A computer readable medium having a computer program stored thereon for
2 instructing a computer to perform a method comprising:
3 requesting a first communication link connection on a network using a default
4 transfer rate;
5 requesting a second communication link connection on the network using a
6 secondary transfer rate, if the requested first communication link connection at the
7 default transfer rate is unsuccessful;
8 monitoring a number of successful communication link connections established
9 using the secondary transfer rate; and
10 changing a value of the default transfer rate to a value of the secondary transfer
11 rate if the number of successful communication link connections at the secondary
12 transfer rate exceeds a predetermined threshold value.

1 15. A computer readable medium having a computer program stored thereon for
2 instructing a computer to perform a method comprising:
3 establishing a plurality of communication links on the data communication
4 network, each one of the communication links comprises:
5 requesting a first data communication link using a default
6 communication transfer rate of 64 Kbps,
7 receiving an indication from the data communication network that the
8 first data communication link was unsuccessful, and

9 requesting a second data communication link using a secondary
 10 communication transfer rate of 56 Kbps;
 11 monitoring a number of unsuccessful first data communication link requests
 12 using the default communication transfer rate;
 13 changing the default communication transfer rate to 56 Kbps if the number of
 14 unsuccessful first data communication link requests exceeds a predetermined threshold
 15 value; and
 16 establishing a plurality of subsequent communication links on the data
 17 communication network comprising requesting a first data communication link using a
 18 default communication transfer rate of 56 Kbps.

1 16. A data communication system comprising;
 2 a data communication network capable of operating at a maximum data
 3 communication rate; and
 4 a data communication transmitter coupled to the data communication network
 5 comprising;
 6 a communication interface which is coupled to the data communication
 7 network to establish a data communication link;
 8 a register circuit coupled to a processor to monitor the number of
 9 successful and unsuccessful data communication links; and
 10 the processor initiates data communication links at either a default
 11 communication rate, or a secondary communication rate, and the processor
 12 adjusts a value of the default communication rate in response to the register
 13 circuit.

1 17. The data communication system of claim 16 wherein the data communication
 2 network is an integrated services digital network (ISDN).

1 18. The data communication system of claim 16 wherein the data communication
 2 transmitter can communicate data at either 64 Kbps or 56 Kbps.

1 19. The data communication system of claim 16 wherein the maximum data
2 communication rate of the data communication network is at least 56 Kbps.

1 20. The data communication system of claim 16 wherein the data communication
2 transmitter has a default communication rate of 64 Kbps when a value of the register
3 circuit is less than a predetermined threshold value.

1 21. The data communication system of claim 16 wherein the data communication
2 transmitter adjusts the value of the default communication rate from 64 Kbps to 56
3 Kbps in response to the register circuit.

1 22. A method of operating a communication network, the method comprising:
2 requesting a first communication link connection on the network using a first
3 communication device;
4 initiating a callback operation using a second communication device, the
5 callback operation is initiated following a callback delay; and
6 adjusting a value of the callback delay if the callback operation is unsuccessful.

1 23. The method of claim 22 wherein the value of the callback delay is incremented
2 when the callback operation is unsuccessful.

1 24. The method of claim 22 wherein the value of the callback delay is not
2 incremented when the callback operation is unsuccessful, and the unsuccessful callback
3 operation is assumed to not be the result of the first communication device being busy.

1 25. The method of claim 22 wherein the communication network is an ISDN and the
2 first and second communication devices are communication routers.

1 26. The method of claim 22 wherein the value of the callback delay is incremented
2 when a number of consecutive unsuccessful callback operations exceeds a
3 predetermined threshold value.

1 27. A communication router comprising:
2 a communication interface which can be coupled to a communication
3 network to establish a callback operation to a communication device provided
4 on the communication network; and
5 a processor to determine a callback delay time based upon operating
6 characteristics of the network.

1 28. The communication router of claim 27 further comprising a register for storing a
2 value of the callback delay time.

1 29. The communication router of claim 27 wherein the processor determines the
2 callback delay time based upon success of callback operations.
3

4 30. A data device comprising:
5 a communication interface which can be coupled to a communication
6 network to establish a callback operation, by responding, requesting, initiating, and
7 accepting signals, to and from a communication device provided on the communication
8 network; and
9 a processor to determine a callback delay time based upon operating
10 characteristics of the network; and
11 a communication switch serving the data device.
12

13 31. The data device of claim 30 further comprising a register for storing a value of
14 the callback delay time.
15

$\Gamma_{\text{eff}}^{(1)}(p)$ and $\Gamma_{\text{eff}}^{(2)}(p)$ are the one- and two-loop effective vertices, respectively. The one-loop effective vertex $\Gamma_{\text{eff}}^{(1)}(p)$ is given by